

REMARKS/ARGUMENTS

Applicants respectfully request reconsideration and reexamination of the present invention in view of the above-presented amendments and the following remarks.

Applicants contemporaneously submit a copy of the reference by G. J. Suppes et al in Ind. Eng. Chem. Res. (1998, 37 pages 2029-2038) disclosed at the bottom section of page 8 of the Specification.

Status of the Claims:

Claims 1 through 9 are pending in the subject patent application. Claims 1 through 9 are rejected.

Applicants have amended Claim 4 to correct a minor typographical error pertaining to the spelling of "diisopropylether".

Discussion of the Claimed Invention

The claimed invention relates to a method which can be universally applied to produce a diesel fuel blend from any available stock diesel fuel wherein the stock diesel fuel blend can be prepared to possess any desired flash point and cetane number in order to meet the fuel properties required in any given locality. Current industrial refining processes are not capable of utilizing any available stock diesel fuel, but are limited to a specific stock from which the refining process is tailored to such stock to produce the desired diesel fuel blend.

The present invention, which overcomes the disadvantages of prior art refining methods, relates to a method of producing a diesel fuel blend having a pre-determined flash-point and a pre-determined increase in cetane number, comprising the steps of:

- a) selecting a stock diesel fuel with a flash-point and a cetane number,
- b) establishing the pre-determined flash-point and the pre-determined increase in cetane number of the diesel fuel blend to be produced;

- c) adding an amount of a first oxygenate with a flash-point less than the flash-point of said stock diesel fuel and a cetane number equal to or greater than the cetane number of said stock diesel fuel, said amount being sufficient to adjust the flash-point of the diesel fuel blend to the pre-determined flash-point; and
- d) adding an amount of a second oxygenate with a flash-point equal to or greater than the flash-point of said stock diesel fuel and a cetane number greater than the cetane number of said stock diesel fuel, said amount being sufficient to achieve the pre-determined increase in cetane number wherein the first oxygenate and the second oxygenate are not the same oxygenate.

Step a) involves selecting a stock diesel fuel and identifying its flash point and cetane number. Steps b), c), and d) are concisely summarized in the Specification (page 6, line 13 through page 7, line 3) which states:

“Thereafter, step b) involves establishing the pre-determined flash-point and the pre-determined increase in cetane number of the diesel fuel blend to be produced. This step can be accomplished by identifying the geographic region in which the diesel fuel blend shall be sold and setting the pre-determined flash-point and cetane number to ensure that the resulting diesel fuel blend conforms to the minimum legal requirements for such geographic region. Such minimum legal requirements are easily obtained in the public domain.

Step c) involves adding an amount of a first oxygenate with a flash-point less than the flash-point of said stock diesel fuel and a cetane number equal to or greater than the cetane number of said stock diesel fuel, said amount being sufficient to adjust the flash-point of the diesel fuel blend to the pre-determined flash-point. As described herein, numerous compositions of matter meet the definition of the first oxygenate and the first oxygenate to be used in the claimed method may be selected taking into account factors including the availability and cost of such first oxygenate. The first oxygenate is added using conventional apparatus and techniques employed in the art.

Step d) involves adding an amount of a second oxygenate with a flash-point equal to or greater than the flash-point of said stock diesel fuel and a cetane number greater than the cetane number of said stock diesel fuel, said amount being sufficient to achieve the pre-determined increase in cetane number. As described

herein, numerous compositions of matter meet the definition of the second oxygenate and the second oxygenate to be used in the claimed method may be selected taking into account factors including the availability and cost of such second oxygenate. The second oxygenate is added using conventional apparatus and techniques employed in the art."

Rejections Under 35 USC §112, Second Paragraph

The Examiner has rejected Claim 8 stating that:

"Claim 8 is confusing it that it contradict the specification at the fourth full paragraph of page 8 of the specification that "the mixture of the incremental amounts of the first oxygenate and the stock diesel fuel" is used to adjust the final flush point."

Applicants draw the Examiner's attention to Claim 8 which states that "the amount of the first oxygenate to be added is obtained from a calibration curve established by measuring the flash-point of mixtures of the stock diesel fuel and the first oxygenate".

Applicants respectfully point out the fourth full paragraph of page 8 of the specification does not teach that "the mixture of the incremental amounts of the first oxygenate and the stock diesel fuel" is used to adjust the final flash point, as stated by the Examiner in the Office Action. Instead, the fourth full paragraph of page 8 of the specification states:

The amount of the first oxygenate to adjust the final flash-point **can be obtained from a calibration curve established by measuring the final flash-point of respective mixtures of the stock diesel fuel and incremental amounts of the first oxygenate.** Flash point are measured according to standard procedures in the art disclosed in the textbook, Automotive fuels Reference Book, 1995, Society of Automotive Engineer, Inc. (ISBN 1-56091-589-7") (**emphasis added**)

A comparison of the language of Claim 8 and the fourth full paragraph of page 8 of the Specification demonstrates that the referenced Specification and Claim 8 do not present a contradiction. Instead, the referenced Specification provides an essentially verbatim description in support of Claim 8. Therefore, Claim 8 fully conforms to the requirements of

35 USC §112, Second Paragraph, and Applicants respectfully request the Examiner to withdraw this basis of rejection.

The Examiner has rejected Claim 9 stating that:

“Claim 9 is confusing it that it contradict the specification at the bridging paragraph of pages 9-10 that by “measuring the cetane number of mixtures of the stock diesel fuel and incremental amounts of the second oxygenate”.

Applicants draw the Examiner's attention to Claim 9 which states that “the amount of the second oxygenate to be added is obtained from a calibration curve established by measuring the cetane number of mixtures of the stock diesel fuel and the second oxygenate.”

The bridging paragraph of pages 9-10 of the specification states:

The amount of the second oxygenate required to reach the predetermined increase in cetane number of the diesel fuel blend can be obtained from a calibration curve established by measuring the cetane number of respective mixtures of the stock diesel fuel and incremental amounts of the second oxygenate **(i.e., mixtures formed by adding various volume percentages of second oxygenate the stock diesel fuel).**
(emphasis added)

A comparison of the language of Claim 9 and the bridging paragraph of pages 9-10 of the Specification demonstrates that the referenced Specification and Claim 9 do not present a contradiction. Instead, the referenced Specification provides an essentially verbatim description in support of Claim 9. Therefore, Claim 9 fully conforms to the requirements of 35 USC §112, Second Paragraph and Applicants respectfully request the Examiner to withdraw this basis of rejection.

Rejections Under 35 USC §112, First Paragraph

The Examiner has rejected Claims 8 and 9 under 35 U.S.C. 112, first paragraph, contending that the disclosure is not enabling, stating:

"Incremental amounts of the first oxygenate" and "incremental amounts of the second oxygenate" is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F. 2d 1229, 188 USPQ 356 (CCPA 1976). The disclosure at the fourth full paragraph of page 8 and the bridging paragraph of pages 9-10 of the instant specification demonstrate that said particular features were considered essential by the applicant, are not reflected in the claims which are rejected."

Applicants respectfully state that this rejection is without foundation. Applicants have discussed the cited portions of the specification in detail. *In re Mayhew* is not relevant to this case as Claims 8 and 9 present the element presented in the cited portions of the specification. The Patent Law is well established that the reader of a specification cannot divorce oneself from the basic principles of science nor a common understanding of the English language.

The Examiner's attention is drawn to the primary definition of "incremental" presented in Webster's Ninth New Collegiate Dictionary (A Merriam-Webster) which states:

In-cre-ment 1: the action or process of increasing esp. in quantity or value

Moreover, the bridging paragraph presented on pages 9-10 of the Specification defines the concept of increment by stating "incremental amounts of the second oxygenate (i.e., mixtures formed by adding various volume percentages of second oxygenate [to] the stock diesel fuel".

For avoidance of doubt, the bridging paragraph of pages 9-10 of the specification is again provided:

The amount of the second oxygenate required to reach the predetermined increase in cetane number of the diesel fuel blend can be obtained from a calibration curve established by measuring the cetane number of respective mixtures of the stock diesel fuel and incremental amounts of the second oxygenate **(i.e., mixtures formed by adding various volume percentages**

of second oxygenate to the stock diesel fuel).
(emphasis added)

Based on the preceding discussion, Applicants respectfully request the Examiner to withdraw rejection of Claims 8 and 9 under 35 U.S.C. 112, first paragraph.

Rejections Under 35 USC § 103:

Applicants acknowledge their duty under 37 C.F.R. 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. 103(a) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a). No such disclosure is required.

Claims 1 through 6 and 8 through 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art over the Merck Index and Hawley's Condensed Chemical Dictionary.

The Examiner has rejected Claim 7 under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior art (Waller et al 5,858,030) combined with Hawley's Condensed Chemical Dictionary and the Merck Index as applied to claims 1-6 and 8-9 above and further in view of Suppes et al.

The Examiner defined "Admitted Prior Art" as follows:

"Applicants make admission on record of the instant application at page 3 that Admitted Prior Art U.S. Patent 5,858,030 of Waller et al discloses diesel fuel compositions for increasing cetane number by adding oxygenates of dimethoxypropane and dimethoxymethane to diesel fuel. Patent further teaches that "monoglyme", ethylene glycol dimethyl ether (DMET), having a cetane number of 98 is a diesel fuel additive for the purpose of soot and smoke suppression, column 1, lines 61 to column 2, lines 1-5. Waller further teaches that alkylene glycol dialkyl ethers (DAKS) e.g., methylene glycol dimethyl ether (DMMT) is a cetane-improving additive for diesel fuel, column 1, lines 44-50. The said patentee further teaches that surprising and unexpectedly, the combination of DMPP, propylene glycol dimethyl ether and MMET is a synergistic cetane improver

when blended with a conventional diesel fuel column 3, lines 45-54 and Table 3. No only does Waller teaches that their DAAK compounds improve the cetane number of the diesel fuel composition, but that the said compounds have increased volatility that improves the cold starting properties of the diesel fuel composition, column 4 and lines 25-29.”

Applicants provide the following summary of the disclosure of the cited references.

U.S. Patent 5,858,030 (“Waller”) discloses diesel fuel compositions for increasing cetane number wherein an oxygenate of dimethoxypropane and dimethoxyethane with methanol and dimethoxymethane are added to diesel fuel.

The Merck Index at page 459 for #3146 is cited by the Examiner who states that the “Merck Index at page 459 for #3146 diglyme is relied on as a teaching reference for the known flash-point, boiling point and other physical characteristics of diglyme. The Examiner cites the Hawley’s Condensed Chemical Dictionary at page 571 “as a teaching reference for the boiling point for the various glyme, e.g., mono glyme, diglyme, etc.”

G. J. Suppes et al (Ind. Eng. Chem. Res. 1998, 37 p. 2029-2038) (“Suppes”) teaches an equation which can be used to determine the amount of an oxygenate to be added to a fuel adjust the final flash-point. Again, the reference fails to teach or suggest a method for **simultaneously** adjusting cetane number and flash point by utilizing two oxygenate (a first oxygenate and a second oxygenate) in order to produce a diesel fuel blend from any available stock diesel fuel wherein the stock diesel fuel blend can be prepared to possess any desired flash point and cetane number in order to meet the fuel properties required in any given locality.

The Examiner relies upon the following basis for combining the cited references to establish a prima facie case of obviousness:

“Waller clearly teaches the artisan in the art that a combination of a first oxygenate and a second oxygenate that is not the same, wherein the flash point of the first oxygenate is lower than the based fuel, wherein the second oxygenate is equal or greater than the flash point of the based fuel are added to the based fuel to increase it cetane number and inherently the additives would

adjust the flash point of the fuel composition because the flash point of the first oxygenates is lower than the flash point of the based fuel. The secondary references provide the motivation to the artisan in the art to select a glyme e.g. diglyme, as the secondary oxygenate to add to the first oxygenate e.g. monoglyme, of Waller to render claims 5 and 6 obvious."

Waller teaches compositions capable of increasing the cetane number of diesel fuel wherein specific compositions, namely dimethoxypropane and dimethoxyethane with methanol and dimethoxymethane, are added to the diesel fuel. Waller's teachings relate to compositions which can be added to increase cetane number. In contrast, Applicants' process relates to a refining process which can be universally applied to any fuel stock to meet local requirements pertaining to cetane number and flash point. This concept is presented in the Specification (page 14 –24) which states:

"Researchers are looking for a method which can be universally applied to produce a diesel fuel blend from any available stock diesel fuel **wherein the diesel fuel blend can be prepared to possess any desired flash point and cetane number in order to meet the fuel properties required in any given locality.** (emphasis added)

Furthermore, researchers are looking for a method to control the flash-point of a diesel fuel blend utilizing blending components which improve the performance of the diesel fuel blend. An increase in performance can be measured by the increase of cetane number of the blended fuel, a decrease in particulate matter, negligible effect on cloud point and miscibility over a wide temperature range."

Waller fails to teach or suggest steps (a), (b) (c) and (d) of Claim 1. Turning to the teachings of the secondary references, Suppes et al, The Merck Index and Hawley's Condensed Chemical Dictionary collectively fail to teach or suggest a process capable of meeting the objective to be solved by Applicants' invention, namely, to provide a a method which can be universally applied to produce a diesel fuel blend from any available stock diesel fuel wherein the diesel fuel blend can be prepared to possess any desired flash point and cetane number in order to meet the fuel properties required in any given locality.

For example, step (c) of Claim 1 reads:

- c) adding an amount of a first oxygenate with a flash-point less than the flash-point of said stock diesel fuel and a cetane number equal to or greater than the cetane number of said stock diesel fuel, said amount being sufficient to adjust the flash-point of the diesel fuel blend to the pre-determined flash-point;

The cited references taken alone or in combination fail to teach or suggest the disclosure of step (c) in order to achieve the objective of the claimed invention.

Step (d) of Claim 1 reads:

- d) adding an amount of a second oxygenate with a flash-point equal to or greater than the flash-point of said stock diesel fuel and a cetane number greater than the cetane number of said stock diesel fuel, said amount being sufficient to achieve the pre-determined increase in cetane number

The cited references taken alone or in combination fail to teach or suggest the disclosure of step (d) in order to achieve the objective of the claimed invention.

Applicants respectfully submit that pending claims 1 through 9 are now in form for allowance and provide the following citations as controlling on the issue of obviousness.

The court, in In re Wesslau, 147 U.S.P.Q. 391, at 391 (CCPA, 1965) stated that:

"The ever present question in cases within the ambit of 35 U.S.C. 103 is whether the subject matter as a whole would have been obvious to one of ordinary skill in the art following the teachings of the prior art at the time the invention was made. It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art". (emphasis added)

The Board of Appeals has followed this line of precedent by requiring that obviousness-type rejections must be based upon the teachings of each reference as a whole as opposed to merely choosing the desired elements of each of the cited references in disregard for the general teachings of the reference. Moreover, the reference must provide the motivation for

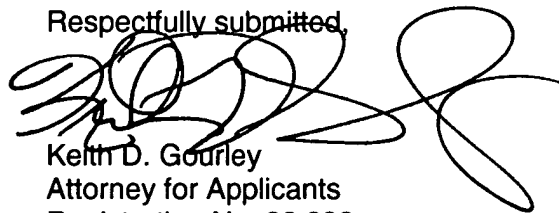
one or ordinary skill in the art to combine the precise elements of the claimed invention in order to make out an obviousness rejection. The Board, in Ex parte Clapp 227 U.S.P.Q. 972 (BAI, 1985) stated that:

"Presuming arguendo that the references show the elements or concepts urged by the examiner, the examiner has presented no line of reasoning, and we know of none, as to why the artisan viewing only the collective teachings of the references would have found it obvious to selectively pick and choose various elements and/or concepts from the several references relied on to arrive at the claimed invention. In the instant application, the examiner has done little more than cite references to show that one or more elements or subcombinations thereof, when each is viewed in a vacuum, is known. The claimed invention, however, is clearly directed to a combination of elements. That is to say, appellant does not claim that he has invented one or more new elements but has presented claims to a new combination of elements. To support the conclusion that the claimed combination is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed combination or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references. (emphasis added)

Summary

Applicants respectfully submit that the rejections and objections set forth by the Examiner have been overcome and Applicants request favorable reconsideration and prompt allowance of the pending claims.

Respectfully submitted,



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